

Sub  
131

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2
--	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	---

In general, a mobile radio system is known which comprises a plurality of radio base stations each of which is connected to a base station control apparatus by an asynchronous transmission mode (ATM) fashion.

In such a system, it is necessary for header information of 24 bits in an ATM cell to have an individual value in each of the radio base stations inasmuch as the header information must be recognized in the base station control apparatus on carrying out transmission and reception between the base station control apparatus and each of the radio base stations. The header information may be representative of an identifier and may be called a VPI/VCI in ATM fashion. When each of the radio base stations starts up in the mobile radio system, the VPI/VCI is not determined in each of the radio base stations. Therefore, it is necessary to individually allocate the VPI/VCI to each of the radio base stations by the base

station control apparatus.

The base station control apparatus manages the VPI/VCI of each radio base station. The VPI/VCI at the time of setting to each radio base station may be different from the VPI/VCI at the subsequent time, by mistake such as a line error, as will be described later.

Inasmuch as the radio base station carries out reception of a message signal in accordance with the VPI/VCI, it is impossible for a specific one of the radio base stations to receive the message signal when the VPI/VCI varies in the specific radio base station. It is impossible to control the specific radio base station by the base station control apparatus. As a result, it is necessary for a person to go to the place where the specific radio base station is installed, in order to reset the specific radio base station.

#### Summary of the Invention:

It is an object of this invention to provide a mobile radio system capable of preventing control of each of radio base stations from becoming impossible.

Other objects of this invention will become clear as the description proceeds.

On describing the gist of this invention, it is possible to understand that a mobile radio system comprises a base station control apparatus for controlling first through N-th radio base stations each of which is connected to said base station control apparatus, where N represents

Sub B

invention  
means for  
identifi  
the transm  
dual iden  
identifier  
become a  
don the t  
time dura

Brief Description of the Drawings:

2

Fig. 3 shows a view for describing a link connection in the mobile radio system illustrated in Fig. 2.

Referring to Fig. 1, a link connection of a conventional mobile radio system will be described at first in order to facilitate an understanding of this invention. It will be assumed that a radio base station 11 starts up and that VPI/VCI = "1" should be allocated to the radio base station 11. At this time, it will be assumed that a base station control apparatus 12 allocates VPI/VCI = "2" to the radio base station 11 by mistake such as a line error. More particularly, the base station control apparatus 12 may transmit an allocation signal having VPI/VCI = "2" to the radio base station 11. In the radio base station 11, the allocation signal is received by an ATM cell reception section 11a. Supplied with the allocation signal, a central processing unit (CPU) 11b sets VPI/VCI = "2" in a VPI/VCI filter (not shown).

As readily understood from the above description, the base station control apparatus 12 recognizes that the VPI/VCI of the radio base station A is equal to "1". Therefore, the base station control apparatus 12 makes the VPI/VCI be "1" in order to transmit a message signal to the radio base station 11. Inasmuch as the VPI/VCI filter actually has VPI/VCI = "2", the radio base station 11

B3 Cont  
abandons the message signal having VPI/VCI = "1" and turns on a light to indicate an error.

When the base station control apparatus 12 again makes the VPI/VCI be "1" in order to transmit the message signal to the radio base station 11, the radio base station 11 abandons the message signal having VPI/VCI = "1" and turns on the light to indicate the error inasmuch as the VPI/VCI filter has VPI/VCI = "2".

As described above, the base station control apparatus manages the VPI/VCI in each of the radio base stations. The VPI/VCI at the time of setting to each radio base station may be different from the VPI/VCI at the subsequent time, by mistake such as the line error.

Inasmuch as the radio base station carries out reception of a message signal in accordance with the VPI/VCI, it is impossible for a specific one of the radio base stations to receive the message signal when the VPI/VCI varies in the specific radio base station. It is impossible to control the specific radio base station by the base station control apparatus. As a result, it is necessary for a person to go to the place where the specific radio base station is installed, in order to reset the specific radio base station.

Referring to Fig. 2, description will proceed to a mobile radio system according to a preferred embodiment of this invention. The mobile radio system comprises first through N-th radio base stations 21-1 to 21-N which are connected to a base station control apparatus 22 by an ATM

Referring to Fig. 3 in addition to Fig. 2, it will be assumed that an n-th radio base station 21-n starts up in accordance with a start-up sequence, where n is a

Referring to Fig. 3 in addition to Fig. 2, it will be assumed that an n-th radio base station 21-n starts up in accordance with a start-up sequence, where n is a

variable between 1 and N, both inclusive. The individual VPI/VCI has not been set in the n-th radio base station 21-n yet. It will be assumed that the base station control apparatus 22 should allocate VPI/VCI = "1" to the n-th radio base station 21-n. At this time, it will be assumed that the base station control apparatus 22 allocates VPI/VCI = "2" to the n-th radio base station 21-n by mistake such as a line error. More particularly, the base station control apparatus 22 may transmit an allocation signal having VPI/VCI = "2" to the n-th radio base station 21-n by mistake such as a line error. In the n-th radio base station 21-n, the allocation signal is received by the ATM cell reception section 21b. Supplied with the allocation signal, the CPU 21a sets VPI/VCI = "2" in a VPI/VCI filter (not shown).

As readily understood from the above description, the base station control apparatus 22 recognizes that the individual VPI/VCI of the n-th radio base station 21-n is equal to "1". Therefore, the base station control apparatus 22 makes the transmission VPI/VCI be "1" in order to transmit the transmission message signal to the n-th radio base station 21-n. Inasmuch as the VPI/VCI filter actually has VPI/VCI = "2", the n-th radio base station 21-n abandons the message signal having VPI/VCI = "1" and indicates an error inasmuch as the VPI/VCI filter has the individual VPI/VCI = "2". More particularly, the CPU 21a detects the error when the ATM cell reception section 21b indicates the error.

As described above, the ATM cell reception section 21b becomes an error state when the transmission VPI/VCI is not coincident with the individual VPI/VCI. When the error state continues during a predetermined time duration, the CPU 21a resets the ATM data reception section 21b to make the VPI/VCI filter become "no-set". More particularly, the predetermined time duration lapses after the ATM cell reception section 21b becomes the error state.

As readily understood from the above description, the base station control apparatus 22 recognizes that the individual VPI/VCI of the n-th radio base station 21-n is



As described above, each of the radio base stations carries out a reset to wait for allocation of the individual VPI/VCI in case where the error state continues during the predetermined time duration in the start-up sequence of radio base station. Therefore, it is unnecessary for a person to go to a place where an error radio base station is installed, in order to reset the error radio base station, even if the transmission VPI/VCI is not coincident with the individual VPI/VCI by mistake such as a line error.

The CPU 21a monitors the ATM cell reception section 21b to detect the error state of the ATM cell reception section 21b. When the error state continues in the ATM cell reception section 21b during the predetermined time duration, the CPU 21a judges that the transmission VPI/VCI is not coincident with the individual VPI/VCI. The CPU 21a

While this invention has thus far been described in conjunction with the preferred embodiment thereof, it will readily be possible for those skilled in the art to put this invention into practice in various other manners.